

FIGURE 9

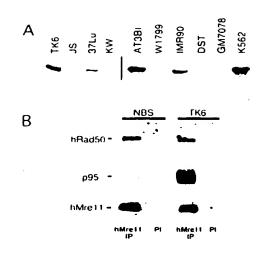


FIGURE 10

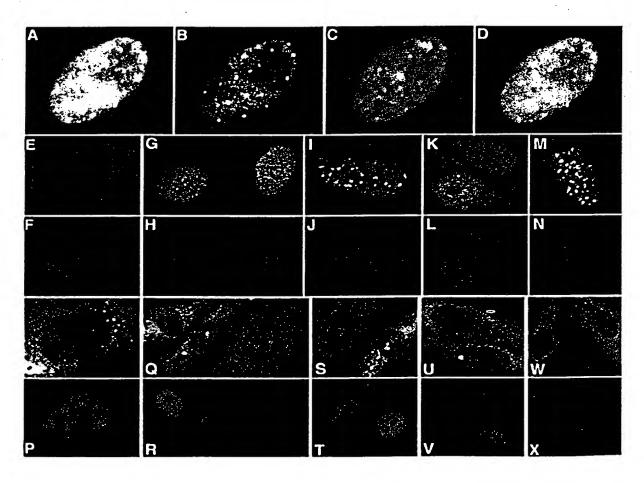


FIGURE 11

Figure 12

| Amino Acid | Codon |
|------------|------------------------------|
| Phe | UUU, UUC |
| Ser | UCU, UCC, UCA, UCG, AGU, AGC |
| Тут | UAU, UAC |
| Cys. | UGU, UGC |
| Leu | UUA, UUG, CUU, CUC, CUA, CUG |
| Trp | UGG |
| Pro | CCU, CCC, CCA, CCG |
| His | CAU, CAC |
| Arg | CGU, CGC, CGA, CGG, AGA, AGG |
| Gln | CAA, CAG |
| Ile | AUU, AUC, AUA |
| Thr | ACU, ACC, ACA, ACG |
| Asn | AAU, AAC |
| Lys | AAA, AAG |
| Met | AUG |
| Val | GUU, GUC, GUA, GUG |
| Ala | GCU, GCC, GCA, GCG |
| Asp | GAU, GAC |
| Gly | GGU, GGC, GGA, GGG |
| Glu | GAA, GAG |
| | |

FIGURE 13

| Original | Exemplary | Preferred |
|----------|--|---------------|
| Residue | Substitutions | Substitutions |
| Ala (A) | val; leu; ile | val |
| Arg (R) | lys; gln; asn | lys |
| Asn (N) | gln; his; lys; arg | gln |
| Asp (D) | glu | glu |
| Cys (C) | ser | ser |
| Gln (Q) | asn | asn |
| Glu (E) | asp | asp |
| Gly (G) | pro | pro |
| His (H) | asn; gln; lys; arg | arg |
| Ile (I) | leu; val; met; ala; phe norleucine | leu |
| Leu (L) | norleucine; ile; val; met; ala; phe | ile |
| Lys (K) | arg; gln; asn | arg |
| Met (M) | leu; phe; ile | leu |
| Phe (F) | leu; val; ile; ala | leu |
| Pro (P) | gly | gly |
| Ser (S) | thr | thr |
| Thr (T) | ser | ser |
| Trp (W) | tyr | tyr |
| Tyr (Y) | trp; phe; thr; ser | phe |
| Val (V) | ile; leu; met; phe; ala; norleucine | leu |

ttcggcacgaggcgcggttgcacgtcggccccagccctgaggagccggaccgatgtggaaactgctgcccgccgcgggcc $\verb"ctttgaagtcgggggatggtattacttttggagtgtttggaagtaaattcagaatagagtatgagcctttggttgcatgc"$ tcttcttgtttagatgtctctgggaaaactgctttaaatcaagctatattgcaacttggaggatttactgtaaacaattg gacagaagaatgcactcaccttgtcatggtatcagtgaaagttaccattaaaacaatatgtgcactcatttgtggacgtc caattgtaaagccagaatattttactgaattcctgaaagcagttcagtccaagaagcagcctccacaaattgaaagtttt ${\tt agggaaaacatttatatttttgaatgccaaacagcataagaaattgagttccgcagttgtctttggaggtggggaagcta}$ ${\tt ggttgataacagaagaagaagaagaacataatttctttttggctccgggaacgtgtgttgttgatacaggaataacagagaacgatagagaacgataga$ aactcacagaccttaattcctgactgtcagaagaaatggattcagtcaataatggatatgctccaaaggcaaggtcttag $\tt gtacaggattaaagacaaccaagcctttcacaaggcgtgtcagttgatgaaaaactaatgccaagcgcc$ aatcaaagtctccaaaatggaacaaaattcagaatgctttcacaagacgcacccactgtaaaggagtcctgcaaaacaa

gctctaataataatagtatggtatcaaatactttggctaagatgagaatcccaaactatcagctttcaccaactaaattg ccaagtataaataaaagtaaagatagggcttctcagcagcagcagaccaactccatcagaaactactttcagccgtctac caaaaaaagggaaagggatgaagaaaatcaagaaatgtcttcatgcaaatcagcaagaatagaaacgtcttgttctcttt aactcagacaataacttatttacagatacagatttaaaatctattgtgaaaaattctgccagtaaatctcatgctgcaga aaagctaagatcaaațaaaaaaagggaaatggatgatgtggccatagaagatgaagtattggaacagttattcaaggaca ${\tt caa} a accagagt {\tt tag} a a a {\tt ttg} a {\tt tg} a {\tt a} a {\tt gt} {\tt tc} a {\tt a} a {\tt a} a {\tt a} a {\tt gt} {\tt gt} a {\tt a} a {\tt gt} {\tt gt} a {\tt a} a {\tt a} a {\tt gt} {\tt gt} a {\tt a} a {\tt gt} {\tt gt} a {\tt$ ${\tt atagaaacaaatgacactttcagtgatgaagcagtaccagaaagtagcaaaatatctcaagaaaatgaaattgggaagaa}$ ${\tt acgtgaactcaaggaagactcactatggtcagctaaagaaatatctaacaatgacaaacttcaggatgatagtgagatgc}$ $\verb|tccaaaaaaagctgttattgactgaatttagatcactggtgattaaaaactctacttccagaaatccgtctggcataaat|$ $\tt gatgattatggtcaactaaaaaatttcaagaaattcaaaaaggtcacatatcctggagcaggaaaacttccacacatcat$ tggaggatcagatctaatagctcatcatgctcgaaagaatacagaactagaagagtggctaaggcaggaaatggaggtacaaaatcaacatgcaaaagaagagtctcttgctgatgatcttttttagatacaatccttatttaaaaaaggagaagataactg aggattttaaaaagaagccatggaaaaacttcctagtaagcatctacttcaggccaacaaggttatatgaatatatagtg taacaattgtttgtyctgttttcaggctttgtcattgcatcttttttttcatttttaaatgtgttttgtttattaaatagt taatatagtcacagttcaaaattctaaatrtacgtaaggtaaaggactaaagtcacccttccaccattgtcctagctact tggttcccctcagaaaaaattcatggatactcatttcttatgratctttccagggattttttgagtcctattcaaattcc tatttttaaataatttcctacacaaatgatagcataacatatgcagtgttctacaccttgcttttttacttagtaagatt atccaaacaaaatggcttcagtggtgcagatgtcacctacatgttattctagtactagaaactgaagaccatgtggagac aaagggagatggtaagaaacaatgaatgtcttttttcaaactttattgacaagtgattttcaagtctgtgttcaaaaata ${\tt tattcatgtacctgtgatccagcaagaagggagttccagtcaagagtcactacaactgattagttgtttagagaatgaga}$ aatggaacagtgaggaatggaggccatatttccatgacttcccttgtaaacagaagcaacagaagggacaagaggctggc ggaacagaaattgggtgagccaatctgcaatttctactacaggcattgagaccagttagattattgaaatattatagaga gttatgaacacttaaattatgatagtggtatgacattggatagaacatgggatactttagaagtagaattgacagggcat attagttgatgaaatggagtcatttgagtctyttaatagccatgtatcataattaccaagtgaagctggtggaacatatg gtctccattttacagttaaggaatataatggacagattaatattgttytctgtcatgcccacaatccctttctaaggaag ${\tt aaatattgggtgttgtccagtatttttccctttttaaccmttcccaattcgggtgtgtaggtggatgtttccatttgggt}$ ${\tt tttaatttgtatatccctgatagctataattgggtcatagaaattctttatacattctagatgcaagtctcttgycggat}$ ${\tt atacgtattgagatattacacctagtctgtggcttgactgttttctttatgtcttttgatgaatagaagttttaaatttt}$ ttttttcccccatacaagtatccagtcattgtaacactgtttattgaaagaattatcctttcctcattaaattaccttgc caattagtaaaaaatcaattaaccatrmarmmmrrrggatccactagttctagagcggccgccaccgcggtggagctcca gct

MWKLLPAAGPAGGEPYRLLTGVEYVVGRKNCAILIENDQSISRNHAVLTANFSVTNLSQTDEIPVLTLKDNSKYGTFVNE EKMQNGFSRTLKSGDGITFGVFGSKFRIEYEPLVACSSCLDVSGKTALNQAILQLGGFTVNNWTEECTHLVMVSVKVTIK TICALICGRPIVKPEYFTEFLKAVQSKKQPPQIESFYPPLDEPSIGSKNVDLSGRQERKQIFKGKTFIFLNAKQHKKLSS AVVFGGGEARLITEENEEEHNFFLAPGTCVVDTGITNSQTLIPDCQKKWIQSIMDMLQRQGLRPIPEAEIGLAVIFMTTK NYCDPQGHPSTGLKTTTPGPSLSQGVSVDEKLMPSAPVNTTTYVADTESEQADTWDLSERPKEIKVSKMEQKFRMLSQDA PTVKESCKTSSNNNSMVSNTLAKMRIPNYQLSPTKLPSINKSKDRASQQQQTNSIRNYFQPSTKKRERDEENQEMSSCKS ARIETSCSLLEQTQPATPSLWKNKEQHLSENEPVDTNSDNNLFTDTDLKSIVKNSASKSHAAEKLRSNKKREMDDVAIED EVLEQLFKDTKPELEIDVKVQKQEEDVNVRKRPRMDIETNDTFSDEAVPESSKISQENEIGKKRELKEDSLWSAKEISNN DKLQDDSEMLPKKLLLTEFRSLVIKNSTSRNPSGINDDYGQLKNFKKFKKVTYPGAGKLPHIIGGSDLIAHHARKNTELE EWLRQEMEVQNQHAKEESLADDLFRYNPYLKRRR

FIGURE 15